PROJECT FAUNA FOREVER: Tourism development and its impacts on Amazonian wildlife in Tambopata, Peru.

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Summary

Project Fauna Forever is an environmental research proposal developed by the Research and Monitoring Studies Unit (RAMOS) of the Tambopata Reserve Society (TReeS). TReeS is a not-for-profit conservation organisation that since 1986 has supported biodiversity research, community development, appropriate management of rainforests and environmental education in the Madre de Dios region of south-eastern Peru, with particular reference to the protected areas of Tambopata, i.e. the Tambopata National Reserve and the Bahuaja Sonene National Park. TReeS is a registered UK Charity (No. 298054) and has a registered Peruvian NGO (TReeS-PERU). Biodiversity inventories undertaken in this area since 1979 have provided ample evidence that Tambopata is arguably the most biodiverse corner of Amazonia, if not the Planet. In 1994, as a result, the Peruvian government officially recognised the nearby town of Puerto Maldonado as the Biodiversity Capital of Peru.

Madre de Dios, and particularly the Tambopata area, was the birthplace of nature-based tourism in the Peruvian Amazon. Tourism continues to grow strongly in this area. Tourism activities have the potential for both positive and negative impacts on both an area's environment and its people.

Project Fauna Forever aims to monitor tourism impacts on local wildlife populations in Tambopata, around 5 jungle lodges, based on field research to be undertaken in 2003 and 2004 and on results obtained during a previous base-line study undertaken by TReeS-RAMOS in 1997 and 1998 at these same locations. The wildlife variables of interest include population abundance, species diversity and community structure. In addition, the project will endeavour to determine "acceptable levels of change" in wildlife abundance around lodges. Results will be used to suggest the most appropriate tourism management techniques to minimise impacts where these are found.

Field research will be undertaken by a team of specialists with assistance provided by both international and Peruvian volunteers – the latter of which will include students of biology from local universities in Puerto Maldonado and Cusco.

The Project will be implemented in four consecutive phases commencing in November 2003 and ending in November 2004, during which each of lodges will be investigated for a total of 52 days.

Results will be analysed throughout the duration of the Project and reports for publication will be completed by the beginning of 2005. A long-term fauna monitoring database and Geographic Information System for Tambopata will be developed to aid future fauna research and monitoring efforts. The Project Team will share information on the results with the area's lodges, government and tourism decision makers, and at a number of public seminars in Puerto Maldonado, Cusco and Lima. In addition, two radio programs will be commissioned to provide the wider public in Tambopata with information pertaining to the Project, and the Project website will be used to reach an international audience.

This is the first time in Madre de Dios, if not Peru, that tourism impacts on Amazonian wildlife in and around protected areas have been the subject of systematic and long-term monitoring.

Introduction

Exotic undisturbed landscapes, unique cultures, and above all protected areas with abundant wildlife are attracting tourists to developing countries in ever growing numbers (Ceballos-Lascurain 1996). The tourism and hospitality industry in general now contribute a significant percentage of developing country GDP (WTO 1996). In 2000, 193 million tourists visited developing countries leaving revenues of US$ 145 billion in the process (WTO 2002).

The fastest growing tourism sectors in developing countries are nature-based tourism and eco-tourism, and the tour operators making the most of this demand are those offering visits to protected areas such as national parks and reserves. These tend to have the greatest concentrations of rare, charismatic and photogenic fauna, due in large part to widespread utilisation or persecution of fauna outside protected areas, which although a way of life in many rural settings, is not always compatible with tourism. In Amazonia, for instance – a growing tourist destination – many fauna species are habitually and directly impacted upon by local human populations through: subsistence and commercial hunting for bush meat and skins (Peres 1990, 1996, 1999b, Robinson & Redford 1991, Fragoso 1991, Mittermeier 1993, Ascorra 1997, Bodmer *et al*. 1997, Kirkby & Padilla 1998, Maglianesi 1998, Noss 1998, Smith 1999); persecution of pest species (Rabinowitz & Nottingham 1986), and capture of species for the exotic pet trade. Indirect impacts, in the form of selective logging (Johns et al. 1987, Wallace et al. 1996) and the alteration or destruction of habitats through conversion of forests to agriculture (Barnes et al. 1991) are also important anthropic variables that are currently altering fauna populations and community assemblage across the Amazon basin. This in turn is arguably affecting the long-term stability and viability of this, the largest and most diverse of the Planet's rainforests.

The effects of certain human activities which aren't intentionally destructive and don't directly alter large areas of habitat have been little studied. Tourism is a case in point.

Uncontrolled or unscrupulous tourism can pose a serious threat to both the cultural and natural environments, affecting both the make-up of local societies (Conservation International 1999) and the very wildlife, habitats and protected areas that are the basis of the attraction (Pigram 1980, Boyle & Samson 1985, Boo 1990, Groom 1990, Wallace 1993, Staib & Schenck 1994, Hidinger 1996, Yoon 1997). Negative tourism impacts that have been commonly documented range from erosion; water, air and soil pollution; introduction of alien species and diseases; disruption or destruction of feeding and/or breeding habitats; redistribution of wild populations; local reductions in abundance, and so forth. Environmental problems such as these can lead to long-term impacts at the habitat, community and species level and can put the very future of local tourist industries at stake by reducing the attractiveness of a destination (Mieczkowski 1995, Mihalic 2000).

It must not be forgotten that tourism in and around protected areas has brought much economic benefit to local rural and otherwise isolated communities (Walpole & Goodwin 2000, Kirkby 2002a), and via the use of park or reserve entrance fees has also contributed to the administration, management and conservation of such areas (Kirkby 2002b). Tourism in many cases offers local people an opportunity to develop alternative non-consumptive uses of wildlife (Fernandez & Kirkby 2002) in and around protected areas, where generally local people have had to forfeit extraction of natural resources including fauna from these areas.

The trade off between economic development and negative tourism impacts is currently a much discussed issue in Peru, particularly amongst tour operators, protected area managers, non governmental organisations and centres of higher education. Due largely to a lack of long-term studies of the issue, there is still much debate regarding the importance and magnitude of tourism related impacts on the natural environment and how best to deal with these impacts when, or if, they arise.

AIMS

This proposal builds upon the results of a base line study undertaken by one of the authors (Kirkby et al. 2000) between 1997-1998 in and around the rainforests of the Tambopata National Reserve in south-eastern Peru. It aims to:

1. Investigate the long-term changes in relative abundance and biomass of wildlife, species diversity, and community structure in forest subject to constant pressure from tourists and activities directly related to this industry, and in comparable forest well away from the influence of tourism;
2. Determine acceptable levels of change in faunal populations around jungle lodges based on the opinions of tourists, lodge personnel, protected area administrators, Neotropical fauna specialists, and the general public;
3. Identify appropriate tourist management techniques, including trail-use carrying capacities and optimum tourist group size, which both tour companies and protected area administrators should consider to mitigate impacts if these are found;
4. Determine detailed levels of Beta diversity, that is to say the degree to which species diversity varies between locations;
5. Develop a long-term fauna monitoring database and Geographical Information System for Tambopata to be stored at the Tambopata Reserve Society headquarters

in Peru, enabling information from past and future fauna studies in the area to be integrated and compared;

6. Train a series of local biologists, mainly undergraduate students from the National Amazon University of Madre de Dios (UNAMAD) and the National University San Antonio Abad of Cusco (UNSAAC), in methodologies for monitoring Neotropical fauna populations, including techniques in database and GIS management;
7. Divulge results and recommendations to tour operators, local authorities and institutions, the local population, and the scientific community at large, through a local radio program, a public seminar, and publications in Spanish (to be distributed locally and nationally), and a peer-reviewed scientific article in English to be published in an appropriate international journal.

The project will be Directed by the Research and Monitoring Studies Unit (RAMOS) of the Tambopata Reserve Society (TReeS). TReeS is a not-for-profit organisation and UK Charity (No. 298054) that has been active in Tambopata since 1986. TReeS-Peru is its registered counterpart in Peru.

Tourism and Protected Areas in Peru

In 2002, Peru hosted 1 million foreign tourists, just under half of which visited the city of Cusco in the Andean highlands – the imperial city of the Incas – and it's associated archaeological sites such as Saqsayhuaman, the Sacred valley, and the Inca Trail which leads to the centre-piece of Peruvian tourism – Machupicchu. Machupicchu is located within the Machupicchu National Sanctuary, one of the 56 protected areas in Peru which include national parks, historical sanctuaries, national reserves, communal reserves, reserved zones, and state reserves for indigenous indians, all of which are centrally managed and controlled by the National Institute for Natural Resources (INRENA) through the National System of Protected Areas (known as SINANPE) with funding provided through bilateral agreements, including debt for nature swaps; natural resource extraction concessions (brazil nuts, commercial fishing, etc.) and tourism entrance fees.

Madre de Dios, and particularly the Tambopata region (Fig. 1), was the birthplace of nature-based tourism in the Peruvian Amazon (1970s) and remains so to this day (Groom *et al*. 1991, Palacio 1999, Gunther personal communication). A detailed history of tourism development in Tambopata and of particular lodges can be found in Duellman & Koechlin (1991), Groom et al. (1991), CDC (1995), Stronza (1996), GESUREMAD (1997), Palacio (1999), CTAR-Inka (1998), Foulks 2000, Kirkby et al. (2000), and Hurtado (2001). In 2002, a total of 25,372 tourists visited Madre de Dios, the majority of which visited Tambopata (22,260), due to its excellent air transport links with Cusco, whilst the remainder visited Manu (2,877) and Tahuamanu (235).

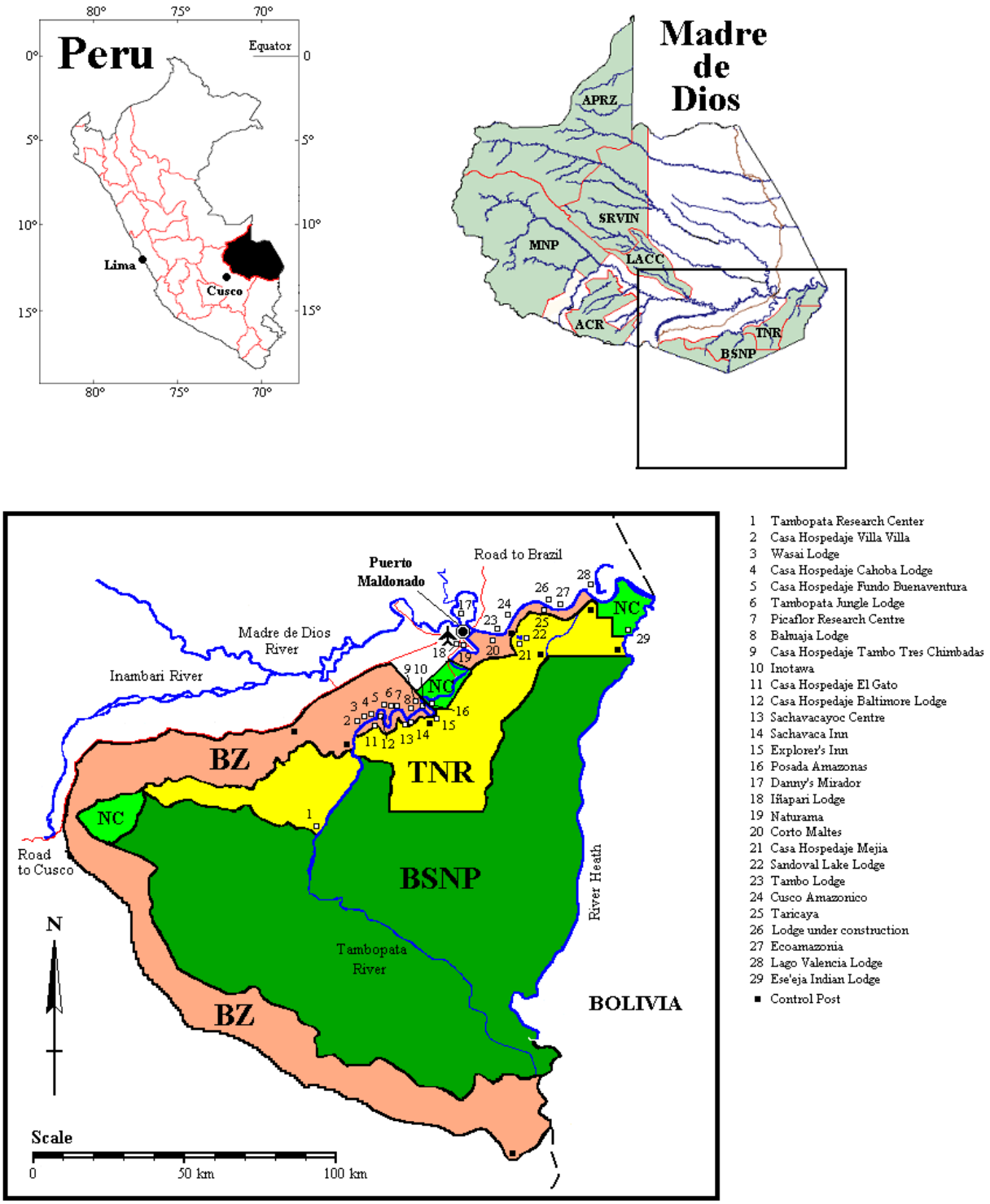

Fig. 1. Location of the Tambopata National Reserve (TNR), Bahuaja Sonene National Park (BSNP), Buffer Zone (BZ) and other protected areas in Madre de Dios; □ = tourist establishments; NC = native community; MNP = Manu National Park; ACR = Amarakaeri Communal Reserve; APRZ = Alto Purus Reserved Zone; SRVIN = State Reserve for Voluntarily Isolated Natives; LACC = Los Amigos Conservation Concession.

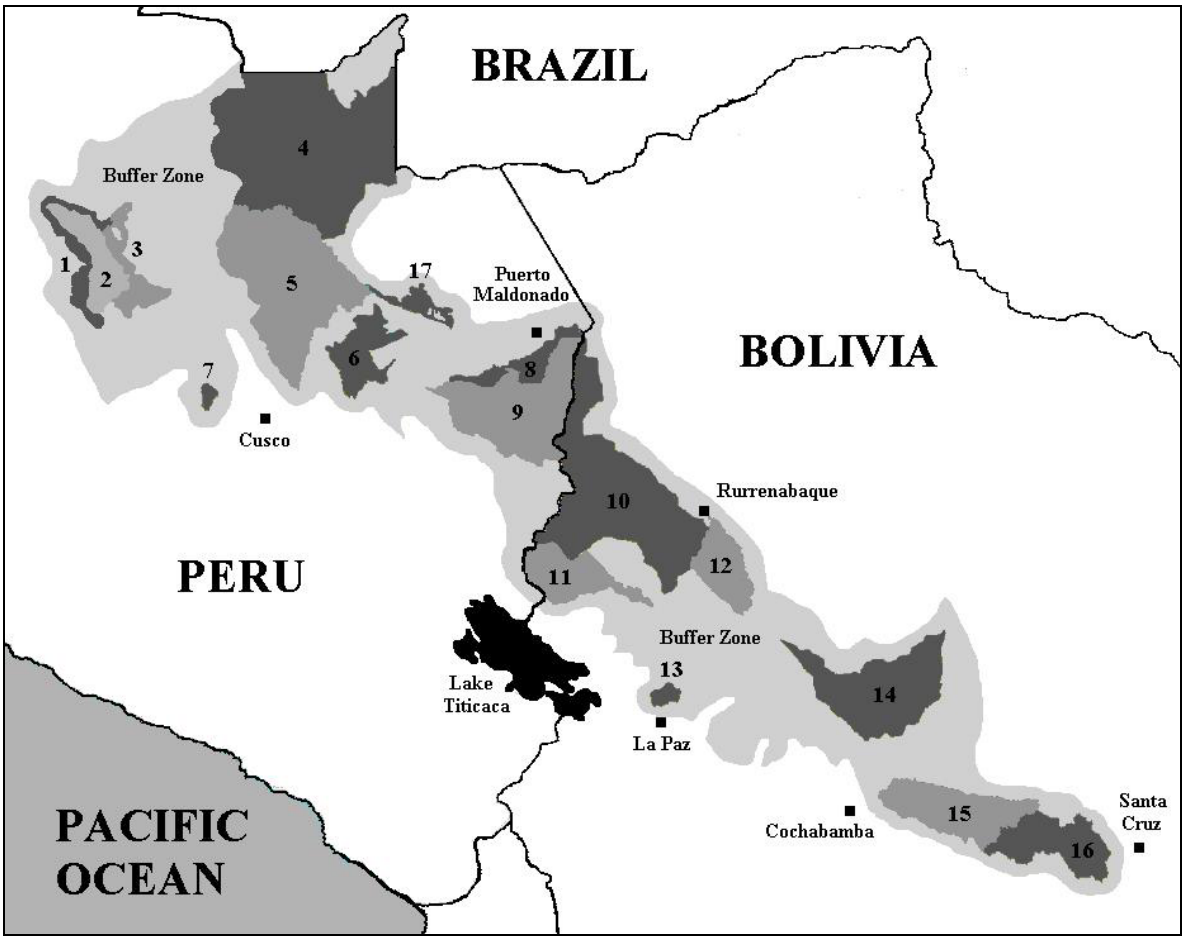

Fig. 2. The Vilcabamba–Amboro Rainforest Corridor (after Conservation International 2002). 1 = Ashaninka Comunal Reserve; 2 = Otishi National Park; 3 = Machiguenga Comunal Reserve; 4 = Alto Purus Reserved Zone; 5 = Manu National Park; 6 = Amarakaeri Comunal Reserve; 7 = Historic Sanctuary of Machupicchu; 8 = Tambopata National Reserve; 9 = Bahuaja Sonene National Park; 10 = Madidi National Park; 11 = Apolobamba Biosphere Reserve; 12 = Pilón Lajas Biosphere Reserve; 13 = Cotapata National Park; 14 = Isiboro Secure National Park; 15 = Carrasco National Park; 16 = Amboró National Park; 17 = Los Amigos Conservation Concession.

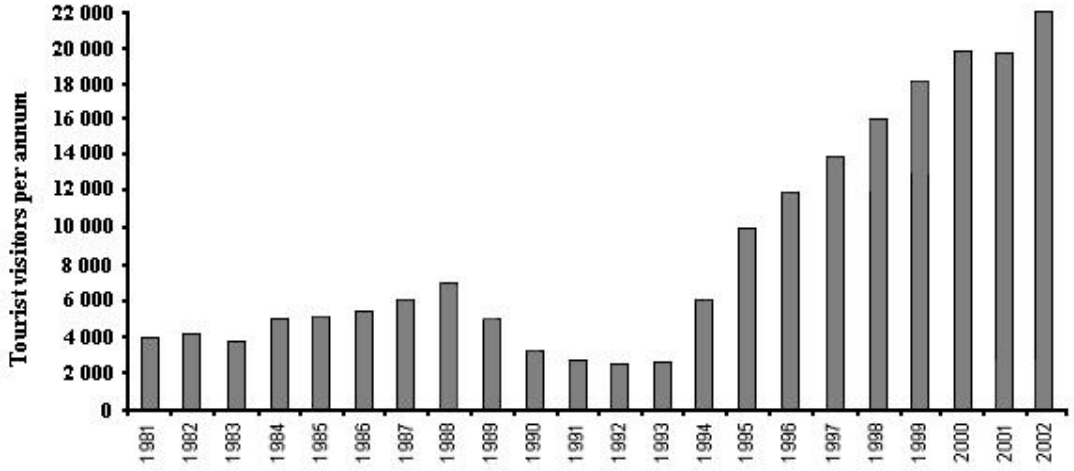

Fig. 3. Tourist visitors to Puerto Maldonado, 1981-2001. Based on Kirkby et al. (2000) and DRITINCI-MDD (2003).

Study Area

PROTECTED AREAS

The protected areas at the centre of the this proposal are the Tambopata National Reserve (TNR), created in 2001 with an area of 274,690 hectares, and the Bahuaja Sonene National Park (BSNP), first created in 1996 and subsequently extended in 2001 with a current area of 1.09 million hectares (Fig. 1). Both protected areas supersede the Tambopata Candamo Reserved Zone (TCRZ) which was created in 1990. Both derive their name from the Tambopata River which the local native Ese'eja people call Bahuaja. This river is born high up in the Andes in the Sandia region of Puno and subsequently flows into the Madre de Dios River at Puerto Maldonado.

BIODIVERSITY

Biodiversity inventories since 1979 have provided ample evidence that Tambopata is arguably the most diverse corner of Amazonia and Puerto Maldonado was officially recognised by the Peruvian government as the Biodiversity Capital of the nation in 1994. Tambopata is home to approximately 7% of the world's bird species (~600) and 4% of the world's mammal species (~160). It is thought that the high levels of biodiversity observed are the result of the fact that Tambopata lies in a transitional zone between humid tropical and subtropical rainforest (ONERN 1972); the altitudinal gradient from north to south varies from 200 m to 2,000 m; precipitation varies considerably from year to year (mean 2,400 mm); rapid changes in temperature are common during the dry season (April-October), with a minimum of 8 ºC a maximum of 34 ºC and a mean of 24 ºC; island savannah ecosystems are present to the east (Pampas del Heath); and there is biological evidence to suggest that Tambopata was once a Pleistocene "refugium" for many species. Conservation International has identified Peru as a "megadiverse" country and the Tambopata region as an important international biodiversity "hotspot".

ENDANGERED SPECIES

Tambopata is home to 14 vertebrates listed in the IUCN Red Data Book and considered highly endangered in the rest of their range: Giant anteater (*Myrmecophaga tridactyla*), Giant armadillo (*Priodontes maximus*), Bush dog (*Speothus venaticus*), Small-eared dog (*Atelocynus microtis*), Giant river otter (*Pteronura brasiliensis*), Jaguarundi (*Herpailurus yaguarundi*), Ocelot (*Leopardus pardalis*), Jaguar (*Panthera onca*), Spectacled bear (*Tremarctos ornatus*), Crested eagle (*Morphous guianensis*), Harpy eagle (*Harpia harpyja*), Black caiman (*Melanosuchus niger*), Spectacled caiman (*Caiman crocodilus*), and Yellow-spotted side-necked turtle (*Podocnemis unifilis*).

RAINFOREST CORRIDOR

Tambopata is now the centre piece of the Vilcabamba–Amboro Rainforest Corridor (Conservation International 2002) – a string of 17 virtually interconnected protected areas that run from Vilcabamba in central Peru to Amboro in central Bolivia, for a distance of 1,000 km (Fig. 2).

TOURISM DEVELOPMENT

Tambopata is a recognised tourist destination in its own right. In 2002, 22,260 tourists visited the area, each staying for an average of 2.1 nights (Fig. 3). Tourism in Tambopata is characterised to a great extent by large static lodge-based operations or tented camps with their associated clearings, infrastructure, trail network, guides, motorised river transport, etc. (Appendix 1). Such operations are currently a growing phenomenon. In 1989, there were 3 lodges. Today, there are 29 (Fig. 1). Tourism in Tambopata currently generates USD 2 million in local direct and indirect earnings in and around the town of Puerto Maldonado.

THE LODGES

The particular jungle lodges of interest in this study, include: **1.** Explorer's Inn (EI); **2.** Reserva Amazonica (RA), which used to be called Cusco Amazónico Pueblo Hotel; **3.** EcoAmazonía Lodge (ECO); **4.** Sachavacayoc (SACHA); and **5.** Tambopata Research Center (TRC). Together they cater for more than 60% of the tourists that visit Tambopata.

EXPLORERS' INN (EI)

This lodge is located on the southern bank of the Tambopata River (12º50´15´´S, 69º17´30´´W) at the confluence with the La Torre River at a distance of 30 km SSW of Puerto Maldonado (Fig. 1). The EI was built and began operating in 1975. It was the first tourism venture to operate along the Tambopata River at the time. In 1977, the Peruvian government granted Protected Area status to 5.5 km^2 of rainforest around the lodge which became known as the Tambopata Reserve Zone (Stewart 1988). Through its Resident Naturalist Program, which offered free room and board to graduate biologists in exchange for guiding guests, the EI has been very successful in combining tourism with research. Investigations undertaken in the late 1970s and early 1980s found that this area is unique and harbours the highest known levels of biodiversity, for any similar sized locality, on the Planet. The 5.5 km^2 of lowland rainforest around the lodge holds numerous biodiversity world records: Birds 596 species (Parker et al. 1994); Butterflies 1,234 (Lamas 1985, 1994); Dragonflies and Damselflies 151 (Paulson 1985); Horseflies 73 (Wilkerson & Fairchild 1985) and Tiger beetles 29 (Pearson 1985). The creation of successive protected

areas, namely the Tambopata Candamo Reserved Zone and now the TNR and BSNP, would likely not have been possible without the original scientific studies undertaken at EI. The total length of the trail system habitually used by tourists at this lodge is 35 km, and is the oldest and most extensive in the area. Initial forest type classification around the lodge was based largely on hydrological and soil characteristics. Later, Nicholson & Phillips (unpub.) and Phillips (1993) further developed the classification by presenting full forest type descriptions with new information on floristic characters. Further floristic descriptions of the area were undertaken by Conservation International (1994). A total of nine distinct forest types can be clearly recognised.

RESERVA AMAZONICA (RA)

This lodge is located on the northern bank of the Madre de Dios River (12º32´30´´S, 69º03´20´´W) at a distance of 15 km ENE of Puerto Maldonado (Fig. 1). The RA was built and began operating in 1976, shortly after the EI. It was the first tourist lodge to be built along the Madre de Dios River. As in the case of EI, in 1977 the government approved the formation of a reserve around the lodge totalling 10 km^2. The status of the reserve prohibited the extraction or conversion of natural resources by the local inhabitants. However, in 1987 the government failed to renew the reserve status and subsequently previously forested lands close to the lodge were colonised and are now farmed. As in EI, scientific investigations of mammals, birds, herpetofauna and vegetation was also undertaken periodically (Duellman 1987, Davis et al. 1991, Duellman & Salas 1991, Woodman et. al. 1991). Such research, complementary to that undertaken at the EI, further affirmed the biodiversity importance of the Tambopata area. The trail system used by tourists is one of the oldest, although at 5 km it is the least extensive in the area.

ECOAMAZONIA LODGE (ECO)

This lodge is located on the northern bank of the Madre de Dios River (12º31´45´´S, 68º56´10´´W), downstream from RA at a distance of 28 km ENE of Puerto Maldonado (Fig. 1). ECO was constructed in 1993. Little scientific research has been undertaken at this lodge, although Kirkby et al. (2000) documented several species that are new to Tambopata or otherwise very rare. The trail system is 15 km long.

SACHAVACAYOC (SACHA)

The Sachavacayoc area has two neighbouring lodges, separated by barely 300 m (Sachavacayoc Centre and Sachavaca Inn). These are located on the southern bank of the Tambopata River (12º51´15´´S, 69º22´00´´W) at a distance of 35 km SSW of Puerto Maldonado (Fig. 1). The Sachavacayoc Centre was constructed in 1994 by Newton College, an independent international school in Lima, as a centre for conservation and education. The Centre caters mainly for student groups, who stay for 7 days. The Sachavaca Inn is a relatively recent construction, finished in 1997, and caters for general tourists. A small amount of research has been carried out in the forest shared by both lodges although to date no comprehensive inventories have been completed. The lodges have a common trail system consisting of a total of 18 km. The trail system is also used relatively often by tour groups from the Tambopata Jungle Lodge, located 5 km upstream.

TAMBOPATA RESEARCH CENTER (TRC)

This lodge is located on the western bank of the Tambopata River (13º08´10´´S,

69º36´40´´W) at a distance of 75 km SSW of Puerto Maldonado (Fig. 1) in an isolated area of the TNR bordering the BSNP. It was constructed in 1989, within 200 m of a macaw clay lick. Initial activities at this time were dedicated to macaw research (Nycander et al. 1995), although as of 1994 the principle activity switched to tourism. A significant amount of research has been undertaken at this site over the last 15 years and comprehensive inventories of some taxa have been undertaken (Emmons & Romo 1994, Rodriguez & Emmons 1994, Ascorra 1995, Salas 1995). The trail system is 12 km long. The habitats at the TRC have been described in depth by numerous authors (Foster et al. 1994; Kratter, 1995ab, 1997, Kirkby et al. 2000). Importantly, no permanent settlements exist within 40 km of this lodge and hunting pressure is nil.

Methodology & Analysis

TAXONOMIC GROUPS OF INTEREST

The backbone of the proposed biological monitoring program focuses on comparing the relative abundance, density, biomass and diversity of fauna species, as well as community structure, between areas used for tourism (treatment) and areas not used for tourism (control). The main impact factors of interest are trails regularly used by tourists and lodge staff, and the lodges themselves. The taxonomic groups of interest in this study, include: **1.** Mammals; **2.** Birds; **3.** Amphibians; and **4.** Reptiles. Many species within these groups are important natural tourist attractions in their own right, such that the data to be collected will also be of direct interest to lodge administrators, guides and tour companies servicing the Tambopata area.

MAMMALS

In order to assess the relative abundance and absolute density of mammals in treatment and control areas (Fig. 5), including species diversity and community structure, three methods will be employed: transect sampling; footprint counts; and counts of foraging signs (scrapings).

Transect sampling is a commonly used technique for studying mammal populations in forested environments and is discussed in depth by Janzen & Terborgh (1980), Burnham et al. (1980), Terborgh (1983), Whitesides et al. (1988), Brockelman et al. (1987), Buckland et al. (1993), and Peres (1999a). In 1997, parts of the trail system used for tourist excursions were identified and marked for use as treatment transects at each of the 5 lodges. A series of complementary control transects were opened afresh, but well away from areas influenced by tourism. Care was taken to site all transects within floodplain forest to minimise variations due to habitat. The number and combined length of tourist and control transects are summarised in Table 1. The same transects used in 1997-98 will be resampled on this ocassion.

Table 1. Number and combined length of tourist and control transects at each lodge.

Lodge	Tourist Transects		Control Transects	
	No. of transects	Combined length (km)	No. of transects	Combined length (km)
RA	2	3.589	3	4.325
EI	3	3.000	3	3.000
ECO	2	4.700	5	5.725
SACHA	2	3.600	3	3.950
TRC	2	3.850	3	3.700
Total	11	18.739	17	20.700

The same transects will be reused on this ocassion. Transect sampling will involve two observers, who will walk slowly and quietly along the centre-line of a transect at a rate of approximately 1 km/hr, stopping periodically to listen for the presence of mammals. On observing an individual, whether solitary or part of a social group, up to 5 minutes will be spent *in situ* recording data, such as: species; initial detection method (visual or auditory); time of day; height of the individual observed above the forest floor (m) in the case of arboreal species; distance along transect (m); straight-line observer-animal distance (m) to first animal sighted; sighting angle (degrees); number of individuals in group; group width (m); duration of visual contact (minutes); behaviour; presence or absence of young juveniles; and general comments. Some of these variables are illustrated in Fig. 4.

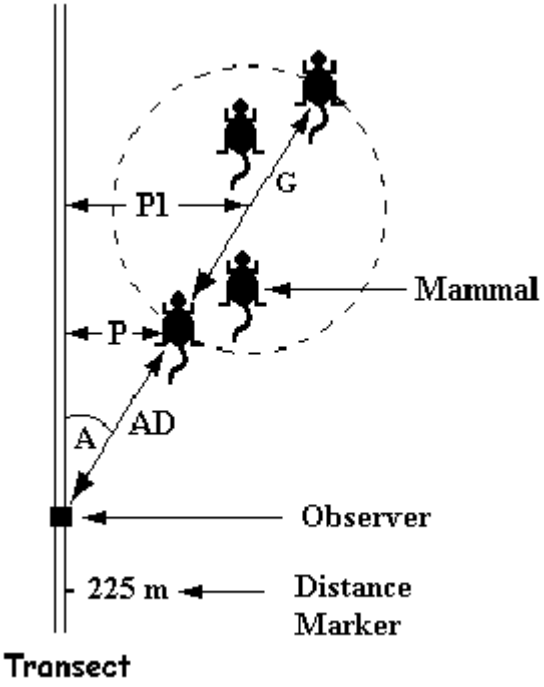

Fig. 4. Schematic diagram of an encounter with a hypothetical mammal group of four individuals, depicting key data types: AD = Straight-line observer-animal distance to first animal sighted; A = Angle between transect and nearest mammal; G = Group Spread (m); P = Perpendicular detection distance from transect to nearest mammal, P1 = Perpendicular detection distance from transect to centre of mammal group, determined through trigonometry (Equation 3.1).

Detection distances are measured accurately to the nearest metre using a 50 m tape measure. Transect sampling is initiated between 0500 - 0800 hrs and ends between 0700 – 1100 hrs, depending on the location and length of the transect. In addition, transects will also be conducted after dark to obtain baseline information for nocturnal species, which has not been done before. Sampling is abandoned if rain falls continuously for more than 30 minutes. However, during short interruptions for rain (<30 minutes) observers remain stationary and complete the census after the rain has stopped. Consecutive sampling along any one transect is undertaken are separated in time by at least 24 hours and direction of travel is reversed where possible.

Distance data generated by transect sampling can now be rapidly and effectively analysed using powerful statistical and computational resources (Laake et al. 1994, Krebs 1999) which the authors are familiar with.

Footprint counts will be undertaken at specific sites adjacent to treatment and control transects where the ground conditions are such that footprints are easily left by passing mammals. These sites will be individually marked and assessed for footprints on a daily basis. After each data collection visit all footprints will be erased. Patterns and differences between treatment and control sites will be analysed using parametric and non-parametric tests.

Counts of foraging signs will be made along a series of marked 100-m long lengths of treatment and control transect and within a distance of 2 m either side of the transects in each case. Such foraging signs, in the form of earth scrapings, are commonly made by large rodents such as agouti (*Dasyprocta variegata*) and paca (*Agouti paca*), as well as peccaries (*Tayassu tajacu* and *T. pecari*) and armadillos (*Dasypus* sp.).

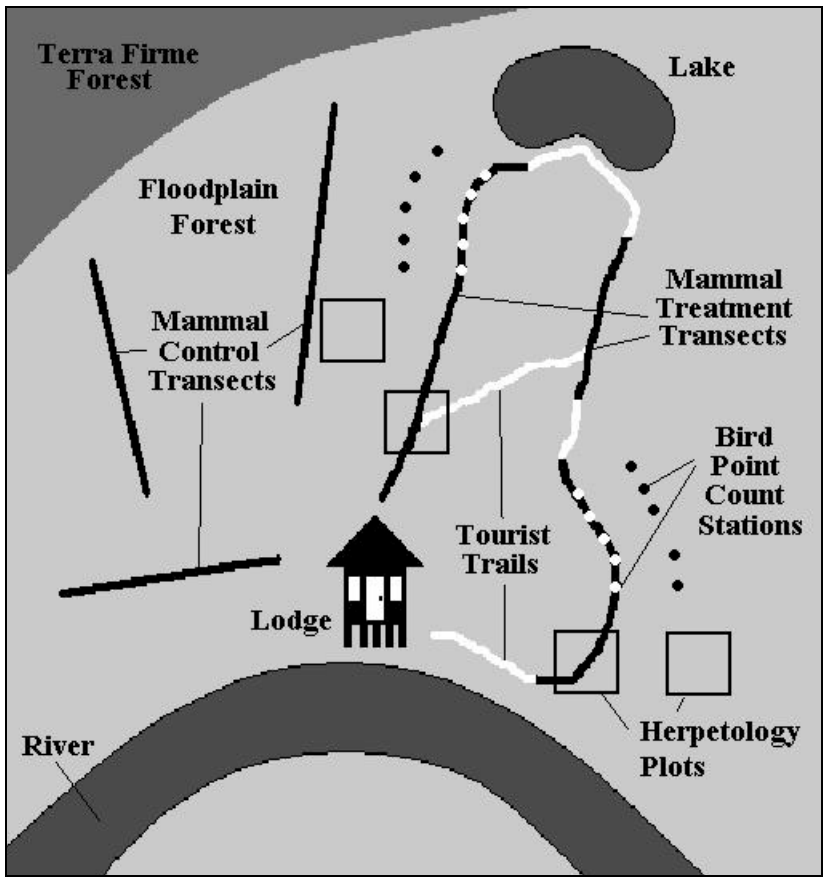

Fig. 5. Schematic diagram showing layout of study areas around a typical lodge for the 3 taxonomic groups.

HERPETOFAUNA (REPTILES & AMPHIBIANS)

In order to assess the abundance and density of reptiles and amphibians two principle

sampling methods will be utilised: quadrat counts, and visual encounter surveys. These will be undertaken within 4 previously sited 1-ha study plots set across tourist trails (treatments) and in forest well away from such trails (control, Fig. 5).

The quadrat method has been shown to be one of the most effective herpetofauna sampling techniques (Jaeger & Inger 1994, Crump and Scott 1994). In 1997, at each of the five lodges, 56 quadrats each measuring 8x8 m were placed in two of the 1 ha plots, one treatment and one control plot. On each ocassion, four observers will intensively search each quadrat simultaneously, with 80% of quadrats searched at night and 20% during the day, due to the largely nocturnal habits of this fauna group. Observers will search for reptiles and amphibians through the leaf litter and on branches, trunks, and leaves up to a height of 2 m. Each quadrat will only be searched once. Each individual encountered will be captured, measured to the nearest 0.1 mm with callipers, weighed on a Pesola spring scale to the nearest 0.25 grams and subsequently released at the point of capture. Also recorded will be substrate and height at which individuals were encountered. Environmental variables at each quadrat are also recorded, including air temperature, percentage cloud cover, diameter of all trees greater than 10 cm dbh, and relative leaf litter depth.

Visual encounter surveys will consist of censusing herpetofauna along 24 parallel 100m-long line transects which were previously laid out within the other two plots. Transects will be censused during both nocturnal and daylight periods. All reptiles and amphibians encountered will be captured and processed as above.

BIRDS

In order to assess the abundance and density of bird species in treatment and control areas, two principle sampling methods will be utilised: point counts using the Virtual Circular Plot Method, and mist-net capture (Fig. 5).

Point counts are commonly used to survey diurnal bird species and is a method that has been frequently used for studying birds (Reynolds et al. 1980, Buckland et al. 1993, Jones et al. 1995, Marsden et al. 1997, Marsden & Jones 1997, Lloyd et al. 1998) and is a particularly effective method when it comes to inconspicuous species or where visibility is restricted – as is the case in rainforests. In 1997, between 39 and 24 point count stations were identified at each of the five lodges, with virtually equal numbers of point count stations located along treatment and control trails. Point counts will begin at 0500 hrs and will conclude at 0830 hrs - after this time bird activity decreases significantly. This method requires that two observers spend 10 minutes at each station recording all bird contacts, visual and auditory. Observers note the time of any contact, species, and the number of individuals in each case. Each contact is also assigned to one of five height categories: 1 = ground level (< 1 metre); 2 = understory (1 – 5 m); 3 = mid-canopy (5 – 15 m); 4 = canopy; 5 = flying above the canopy. When a bird is seen the observer will accurately record the horizontal distance from the centre of the station to the bird. For species that habitually occur in monotypic flocks, such as the parrot species, distances will be recorded from the station to the centre of the flock.

For the more furtive, cryptic and less vocal understory species which can still be under-

represented in point count surveys, mist-netting will be employed. This technique is described in detail by Terborgh & Weske (1975), Karr (1976, 1979), and Lovejoy et al. (1986). Nine mist nets will be located at each of 3 stations, with 3 nets erected at each station in a straight line. Each net will be 2 m high and 12 m long. Nets will be opened at 0600 hrs and closed at 1100 hrs. For each individual bird captured, the following variables will be recorded: date, time, census station, net number, species, sex, age (adult or juvenile), wing length, tail length, culmen length, tarsus length, and weight. Birds will also be marked using plastic coloured and numbered leg rings.

MONITORING PERIOD
Each lodge will be studied on 4 separate occasions from November 2003 through November 2004, for a period of 13 days on each ocassion, twice during the rainy season and twice during the dry season, for a total of 52 days each. The order of visits will be: EI, SACHA, TRC, RA and ECO.

TOURIST TRAIL-USE
Information collected from lodge administrators, guides, and notes taken during visits to the lodges will be used to calculate tourist trail-use for each of the sections of tourist trails under investigation. Data on tourist group size will also be collected in this manner.

TRAIL-USE CARRYING CAPACITY & OPTIMUM GROUP SIZE
Where significant differences in abundance exist between tourist and control areas for any particular species, and/or where there is a strong significant correlation between abundance and tourist trail-use intensity or tourist group size, the data will be used to determine appropriate trail-use carrying capacities and optimum tourist group sizes for each lodge.

ACCEPTABLE LEVELS OF CHANGE
Acceptable levels of human-induced change in local wildlife populations around tourist lodges will be obtained using questionnaires directed at visiting tourists, lodge personnel, protected area administrators, Neotropical fauna specialists, and the general public of Puerto Maldonado. This information will be compared to our biological findings and subsequently used to improve tourism management techniques such as trail-use carrying capacity.

Geographic Information System

A GPS will be used to obtain geo-referenced data of the transects, quadrats, point count stations and other data collection points at each lodge. This information, in conjunction with an MS Access database of results, will be used to show the geographical distribution of sample sites, in addition to illustrating abundance, diversity and community structure characteristics for each lodge. This database could also be enriched with information currently available from other faunal studies in the Tambopata area, as a means of better understanding the bigger picture when it comes to fauna conservation in the region – a task likely to be undertaken by the authors during the post-project period.

TReeS-RAMOS and the Project Team

The Project will be directed by the Research and Monitoring Studies Unit of the Tambopata Reserve Society (TReeS-RAMOS). TReeS is a not-for-profit conservation organisation that since 1986 has supported initiatives dealing with appropriate management of rainforests and biodiversity research in the Madre de Dios region of south-eastern Peru, with particular reference to the protected areas of Tambopata. Between 1997 and 1998, TReeS-RAMOS undertook Project Tambopata – the first instance of tourism impact monitoring in Peru, and which will be the baseline survey against which Project Fauna Forever data will be compared.

The project team will be led by 5 specialists: Chris Kirkby - Director of TReeS-RAMOS; Alan Lee – Mammal and International Co-ordinator; Karen Tailby - Project Manager; one Bird Co-ordinator (Peruvian – name to be confirmed) and one Herpetofauna Co-ordinator (Peruvian – name to be confirmed). Each co-ordinator will be assisted by between 2 and 4 assistants. International assistants will contribute towards project costs. Peruvian assistants will be invited to participate free of charge. The team will be based out of the town of Puerto Maldonado (Fig. 1).

Research Permits

Permits to allow research in protected areas are currently being obtained from the National Institute for Natural Resources (INRENA) – the government body responsible for administrating protected areas in Peru.

Budget

The budge tfor this project has been calculated at USD 78,676.00 (Table 2). This amount also covers pre-project set-up costs (April – October 2003), as well as post-project and publication costs (November 2004 – January 2005).

Table 2. Budget.

ITEMS	TOTAL (USD)	TOTAL (SOLES)	TOTAL (UK£)
Pre-Project Set-up costs	1,725	6,038	1,150
Capital Expenses (mainly field equipment)	3,340	11,690	2,227
Overheads (administration, internal transport)	5,816	20,355	3,877
Food & Accommodation:			
Co-ordinators	10,584	37,044	7,056
Peruvian Assistants	10,584	37,044	7,056
International Assistants	21,168	74,088	14,112
Remuneration: Co-ordinators and Manager	23,700	82,950	15,800
Post-Project & Publication costs	1,760	6,160	1,173
TOTAL	**78,677**	**275,369**	**52,451**

Acknowledgements

We would like to thank the following people for assisting us in one way or another with the development of this proposal: Alfredo Garcia (TReeS-Peru); Carmela Landeo (INRENA); Ernesto Ráez (Conservation International - Peru); Max Gunther (Explorer's Inn); Joe Koechlin and Jose Purisaca (Reserva Amazonica); David Bruggers (Newton College); Kurt Holle, Eduardo Nycander, Mario Napravnik and Marianna Elias (Rainforest Expeditions); Raphael Notin and Kim Faylor (Frankfurt Zoological Society); Emma Tatum-Hume and Juan Julio Duran (Piedras Research Station), Guillermo Subauste, Annie Farris (AF); Sandra Felipa.

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Curriculum Vitae of Authors

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Tel: +51-(0)82-572788 & +51-(0)1-4973069. **E-mail:** chris_kirkby@yahoo.com
Nationality: British **DoB:** 9th Feb. 1972 **Marital Status:** Married

Education

MRes. Ecology & Environmental Management (Distinction), 2001.
The University of York, UK.
BSc. (Honours) Ecological Science (2:1), 1994.
The University of Edinburgh, UK.
International Baccalaureate Diploma, 36/45 points, 1990.
St. Clare's Oxford, UK.

Positions Held

Mar. 2003 – Present	Co-consultant to ProManu and co-director of the Manu Biosphere Reserve Monitoring Project. The aim of which is to develop a baseline of environmental, socio-economic and institutional data for the Manu region in western Madre de Dios and North-eastern Cusco, which will subsequently be used to gauge future monitoirng efforts of this globally important conservation area.
Jan. 2003 – Apr. 2003	Consultant to the National Institute of Natural Resources (INRENA), Conservation International and Pronaturaleza in an evaluation of the tourism potential of the upper Tambopata River and the route connecting the city of Puno with the Bajuaha Sonene National Park (Colorado Sector). The aim of which was to determine whether tourism was a viable alternative activity for the local population a percentage of whom grow coca.
Sep. 2002 – Nov. 2002	Co-consultant to ProManu in an evaluation of the status of wildlife populations around Salvación and Aguanos in the Manu Biosphere Reserve. Position included an analysis of potential tourist attractions, the design of appropriate tourist routes, and recommendations to encourage small-scale participation of local peoples in the ecotourism industry as an alternative use for local wildlife. Study funded by the European Union.
Feb. 2002 – Jun. 2002	Consultant to the World Wide Fund for Nature (WWF-Peru) and INRENA in a study of ecotourism standards and entrance fees for the Tambopata National Reserve (TNR) & Bahuaja Sonene National Park (BSNP), Madre de Dios, Peru, the results of which will form part of the Tourism Management Plan of the afore mentioned protected areas. The position in addition included an evaluation of the economic impact of tourism in the town of Puerto Maldonado.
May 2002	Voluntary assistant to Ing. Antonio Arana in a workshop to gather local opinion of issues for the Master Management Plan for the TNR and BSNP undertaken in the colonist community of Baltimore, River Tambopata, Madre de Dios, Perú.

Jun. 2001 – Sep. 2001	Principal Investigator in a study of the distribution and abundance of *Guadua cf. angustifolia*, Bambuseae, a potential non-wood forest product in Madre de Dios, Peru. A study undertaken in the Los Amigos Conservation Concession and sponsored by the Amazon Conservation Association (ACA), a non-profit organisation based in Washington DC and Puerto Maldonado.
May. 2001 – Jun. 2001	Consultant to Proyecto Castañales, of ACA, to identify faunal indicator species of Brazil-nut (*Bertholletia excelsa*) dominated forests in Madre de Dios, Peru. The results of which formed part of a successful forest certification proposal put forward to the Forest Stewardship Council (FSC).
Jun. 2000 – Sep. 2000	Assistant Project Officer for NPI Red Alert North West, based at the Cumbria Wildlife Trust, Brockhole, Windermere, UK. Post included general duties associated with Red squirrel (*Sciurus vulgaris*) conservation initiatives and environmental education in Cumbria in the North West of England.
Oct. 1999 - Present	Volunteer Committee Member of the Tambopata Reserve Society (TReeS), a UK-Peruvian NGO and UK Charity (No. 298054). TReeS works towards rainforest conservation and appropriate natural resource management in the Peruvian Amazon, by providing technical and financial assistance for rural community-led projects, scientific investigation, and environmental education initiatives.
Feb. 1999 - Oct. 1999	Peru representative and Projects Co-ordinator for TReeS. Position entailed avaluating and reporting on progress regarding existing TReeS projects, assessing proposals for funding, and representing the organisation in round-table discussions of conservation, protected area, and natural resource management issues affecting the Madre de Dios region.
Jun. 1999 – Sep. 1999	Consultant to Proyecto Castañales, of ACA, and Principal Investigator in a field study of the impact of Brazil-nut (*Bertholletia excelsa*) harvesting on mammal populations in the Tambopata Candamo Reserved Zone (TCRZ), Madre de Dios, Peru.
May 1998 - Nov. 1998	Consultant to INRENA, in a CITES-funded post, and Principal Investigator in a field study to evaluate the population ecology of Peccaries (*Tayassu tajacu* and *T. pecari*) in Madre de Dios, Peru. The position also involved editing a report on managing export quotas for peccary hide, results of which were incorporated into national policy in 1999.
Jun. 1996 - Nov. 1998	Director of the Research & Monitoring Studies Unit of the Tambopata Reserve Society (TReeS-RAMOS), and Leader of Project Tambopata: A study of Tourism Development and the Status of Neotropical Lowland Wildlife in Tambopata, South-eastern Peru. Research approved by the Royal Geographical Society, London.
Sep. 1995 - Oct. 1995	Field Assistant on a Manu National Park Authority-funded study of the perceptions of indigenous communities to tourism development along the upper Madre de Dios River, Peru.

Jan. 1995 - Sep. 1995	Resident Naturalist and Tour Guide at the Tambopata Jungle Lodge, Tambopata, Peru. During which I was Principal Investigator in a study of the population ecology of termites.
Sep. 1994 - Dec. 1994	Assistant to Dr. J. Salehe and Dr. A. Rogers, in a GEF-funded floristic study of the Pugu Forest Reserve, Dar es Salaam, Tanzania.
Jul. 1994 - Sep. 1994	Treasurer and Co-investigator in the Edinburgh Veterinary Research Expedition to Tanzania (EVRET'94), which centred on a study of Bovine tuberculosis (*Mycobacterium bovis*) in domestic cattle and wild ungulates in the Mbeya and Iringa Districts of Tanzania. Research approved by the Royal Geographical Society, London, and the Princess Royal (UK).
Jun. 1993 - Sep. 1993	Field Assistant to Dr. K. Glander (Director of Duke University Primate Center, North Carolina, USA) in a study of Mantled howler monkeys (*Alouatta palliata*) in the La Pacífica Reserve, Guanacaste, Costa Rica.

Skills

Information Technology	Windows 2000, MS Office 97, HTML literate.
Statistical packages	SPSS, SYSTAT, Genstat.
Other analytical packages	DISTANCE, TRANSECT, CAPTURE.
Webpages designed	www.geocities.com/chris_kirkby www.geocities.com/project_tambopata_peru www.geocities.com/treesweb, www.geocities.com/marona_mdd www.geocities.com/upperamazon
GPS	Good knowledge of Garmin and Magellan hardware.
GIS	Good knowledge of Arc/Info, Arc/View and related software.
Bird ringing	Completed a course directed by the Centre for Conservation Biology (Stanford University). Experience: ~200 net-hours.
Tree climbing	Good knowledge of rope-based techniques for accessing tree canopies.
Remote photography	Good knowledge of Trail Master Infra-red Photography System.
Driving	Full UK and International driving license since 1989
Languages	English (fluent), Spanish (fluent), Portuguese (basic), Swahili (basic).

Formal Presentations Given

2003 The economic impact of tourism in Puerto Maldonado, Madre de Dios, Peru. At: Tourist guide course, Rainforest Expeditions (Posada Amazonas Lodge, Tambopata).

2002 The diversity and conservation of fauna in Madre de Dios, Peru. At: The University of Amazonia of Madre de Dios (Puerto Maldonado).

2002 Identifying ecotourism standards for the protected areas of Tambopata, Madre de Dios, Peru. At: APAKTONE (Puerto Maldonado).

2001 The distribution, abundance, and future management of Marona bamboo (*Guadua cf. angustifolia*) in Los Amigos, Madre de Dios, Peru. At: The University of Amazonia of Madre de Dios (Puerto Maldonado); The University of York (York); The University of Cusco (Cusco, 2002).

2000 The impact of tourism on wildlife populations in Tambopata, Madre de Dios, Peru. At: Durrell Institute of Conservation Ecology (Canterbury); The Royal Geographical Society (London); The Tambopata Reserve Society (Oxford); The University of Edinburgh (Edinburgh); The University of the West of England (Bristol); INRENA (Puerto Maldonado).

1999 The future of tourism in the Tambopata Candamo Reserved Zone and Bahuaja Sonene National Park. At: INRENA (Puerto Maldonado).
1998 Biology, conservation and sustainable management of Amazonian wildlife. At: INRENA (Puerto Maldonado).

Conferences & Workshops Attended

2002 Building techniques using Guadua bamboo. The American Bamboo Society. Presenters: Dr. Stern and Dr. Marón (Puerto Maldonado).
2001 Guadua bamboo and its potential in Madre de Dios as a non-wood forest product. Proyecto Paca-INRENA & ITTO. Presenters: Dr. Londoño and Dr. Marón (Puerto Maldonado).
2001 British Ecological Society - Winter Conference. Warwick University, UK.
1999 Conservation priorities in the SW Amazon Ecoregion. WWF-Peru (Puerto Maldonado).
1999 Conservation of the Giant River Otter (*Pteronura brasiliensis*) in Peru. Frankfurt Zoological Society & INRENA (Lima). Presenter: Dr. C. Schenk.
1999 Ecotourism Development in Madre de Dios: present and future. Conservation International & CTAR-MDD (Puerto Maldonado).
1999 Wildlife trading in Madre de Dios. CITES & INRENA (Puerto Maldonado).
1997 Ecotourism planning for the Sub-region Madre de Dios, Peru. Organisers: Region Inka, UNDP, Conservation International (Puerto Maldonado).
1995 The 6th National Botanical and Ethnobotanical Congress of Peru. The San Antonio Abad University (Cusco).

Publications and Reports

Fernandez, M. & C.A. Kirkby (2002) Evaluación del estado poblacional de la fauna silvestre y la potencial turística en los bosques de Salvación y Yunguyo, Reserva de Biosfera del Manu, Madre de Dios, Perú. Pro-Manu, Cusco.

Kirkby, C.A. (2002) Estándares Ecoturísticos para la Reserva Nacional Tambopata, el Parque Nacional Bahuaja Sonene, y sus Zonas de Amortiguamiento, Madre de Dios, Perú. WWF-Perú/INRENA, Lima.

Kirkby, C.A. (2002) Análisis Inicial del Impacto Económico del Turismo en Puerto Maldonado y Periferia, Madre de Dios, Perú. WWF-Perú/INRENA, Lima.

Kirkby, C.A. (2002) Optimización de la Tarifa de Entrada para la Reserva Nacional Tambopata y el Parque Nacional Bahuaja Sonene, Madre de Dios, Perú. WWF-Perú/INRENA, Lima.

Kirkby, C.A. (2001) The distribution, abundance, clump characteristics and techniques for managing *Guadua cf. angustifolia*, Bambuseae, a potential non-wood forest product, in Madre de Dios, Peru. Masters thesis, The University of York.

Kirkby, C.A. (2001) Responses of individual *Arabidopsis thaliana* plants to changes in the number and spatial distribution of conspecific neighbours. The University of York. www.geocities.com/chris_kirkby/arabi.htm

Kirkby, C.A. (2001) Estimation of home range, core area, and habitat utilisation of urban foxes (Vulpes vulpes) using a fixed kernel technique in a GIS environment. The University of York. www.geocities.com/chris_kirkby/foxes.htm

Kirkby, C.A., Doan, T.M., Lloyd, H., Cornejo, A., Arizabal, W. & A. Palomino (2000) A study of Tourism Development and the Status of Neotropical Lowland Wildlife in Tambopata, South-eastern Peru: Recommendations for Tourism and Conservation. Tambopata Reserve Society, London.

Kirkby, C.A. (1999) An evaluation of the impacts of Brazil-nut (*Bertholletia excelsa)* harvesting on large mammal populations in the Tambopata Candamo Reserved Zone, Madre de Dios, Peru. Amazon Conservation Association, Washington DC.

Kirkby, C.A. & P. Padilla (1998) An evaluation of the population and management of *Tayassu tajacu* and *T. pecari* in Madre de Dios, Peru. INRENA-CITES, Lima.

Kirkby, C.A. & P. Padilla (1998) Management of export quotas for *Tayassu tajacu* and *T. pecari* in the Peruvian Amazon. INRENA-CITES, Lima.

Kirkby, C.A. (1996) The Tambopata Jungle Lodge: a guide to the rainforests of Tambopata, Madre de Dios, Peru. Peruvian Andean Treks S.A., Cusco.
Kirkby, C.A. (1995) The population ecology of Nasutitermitinae (Insecta : Isoptera) in Tambopata, Peru: a comparative study of primary and secondary forest habitats (unpub.).
Kirkby, C.A. (1994) The distribution and abundance of the amphipod (*Corophium volutator*) in salt marshes on the Forth Estuary. BSc. thesis, The University of Edinburgh. (unpub.)
Kirkby, C.A. (1993) The behavioural ecology of Mantled Howler monkeys (*Alouatta paliata*) in Costa Rica. *Sylva* 1993, 40-45.

References

1. (Academic) Dr. C. Dytham, Dept. of Biology, The University of York, Heslington, York YO10 5DD, UK. E-mail: cd9@york.ac.uk
2. Dr. H. Newing, Durrell Institute of Conservation Ecology (DICE), University of Kent, Canterbury, Kent, UK. E-mail: H.S.Newing@ukc.ac.uk
3. Ms. V. Sequeira, Manager Non-timber Forest Products, Rainforest Alliance, Goodwin-Baker Building, 61 Millet Street, Richmond, VT 05477, USA. E-mail: vas_sequeira@yahoo.com.

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2. Alan Lee (Mammal Team and International Co-ordinator)

Address: Jr. Lambayeque 488, Casilla 28, Puerto Maldonado, Madre de Dios, Peru.
Tel: +51-(0)82-572788 **E-mail:** atklee50@yahoo.co.uk
Nationality: British **DoB:** 11th Mar. 1974 **Marital Status:** Single

Education

Bsc (Honours) Botany of Serpentine Soils (Distinction), 1996
The University of the Witwatersrand, South Africa.
BSc. Botany and Zoology, 1993 - 1995.
The University of the Witwatersrand, South Africa.
TEFL. Teach English as a Foreign Language. 2002
I-2-I online TEFL training.
Diploma in Computing. 2000 - 2001
The Open University, United Kingdom.
C++/C Introduction Certificate. 1999
Scheidigger Computer Courses.

Positions Held

Dec. 2002 – Jan. 2003	Macaw Researcher for Rainforest Expeditions, Tambopata, Madre de Dios, Peru. Duties included measuring Macaw (Ara sp.) chick growth and monitoring Macaw Clay Licks.
Aug. 2002 – Dec. 2002	Resident Naturalist at Explorer's Inn, Tambopata, Madre de Dios, Peru, where I completed a research project for TReeS evaluating the potential impact of trail usage by tourists on the abundance of large mammals. Results of this study have led to the development of a proposal to further investigate this phenomenon.
Mar. 2002 – Jul. 2002	Ambassador for the National Eczema Society on a 6000km cycle ride across South America.

Jan. 2001 – Mar. 2002	Support Administrator for Vianah, Virtual VJV in London, UK. Created and updated the Help web pages for this software company which specializes in hosting information for Joint Ventures
Aug. 2000 – Dec. 2000	Customer Services Executive for British Airways, based out of Heathrow, London, UK.
Jan. 2000 – Jul. 2000	Supervisor of a call center team for NHS Direct dealing in National Health Emergencies, London, UK.
Jan. 1999 – Dec. 1999	Call Centre Operator for Vodafone, London, UK, dealing with network enquiries and helping customers with a variety of issues.
Jan. 1998 – Dec. 1998	Supervisor for a landscaping team for Cedara Scapes, a South African based landscaping company.
Jan. 1997 – Dec. 1997	Game Ranger at Mala Mala Game Reserve - at the time the best of the private game lodges in South Africa. We hosted world famous clients, showing them the marvels of the African environment.
Dec. 1995 – Jan 1996	Principal Investigator in a vegetation and wildlife survey for the Lady Madeleine Nature Reserve in South Africa.
1993 – 1996	I was the Supervisor of a team of Paypoint Operators and salespeople at Keith Kirsten´s Nursery in South Africa. This was a part time position I held throughout my period as a student at the University of the Witwatersrand.
1992	Signalman for the South African Defence Force. I completed one year of mandatory national service for a mobile radio unit.
1986 – 1991	Volunteer for the Friends of Pilanesberg National Park, helping implement educational programs and development schemes.

Skills

Information Technology	Windows 2000, MS Office 97, HTML literate, Javascript, Java and C++.
Other analytical packages	DISTANCE.
Webpages designed	www.geocities.com/alan.lee www.geocities.com/cyclesouthamerica www.pumaonbikes.8m.com www.vianah.com www.geocities.com/kwik_print http://www.duke.edu/~djb4/ Tambopata Macaw Project Website
GPS	Good knowledge of Garmin and Magellan hardware.
Tree climbing	Good knowledge of rope techniques for accessing tree canopies.
Driving	Full SA and International driving license since 1989
Languages	English (fluent), Afrikaans (fluent), Spanish (basic), Zulu (basic).

Publications and Reports

Lee, A. (2002) The effect of Trail Usage on Mammal Distribution at Explorer´s Inn, Tambopata. A Resident

Naturalist Report (unpub.)

Lee, A. (1996) The Vegetation of the Serpentine Soils of Dunbar Valley. BSc Honours thesis, The University of the Witwatersrand. (unpub.)

Lee, A. (1996) The Vegetation of the Lady Madeleine Nature Reserve, Northern Transvaal, South Africa. An Amandabult Internal Publication.

References

1. Donald Brightsmith. Director of Macaw Research for at Tambopata Research Centre. djb4@duke.edu
2. Kim Failor. Resident Naturalist Coordinator at Explorer´s Inn. kimbolyfalo@yahoo.com
3. Keith Myers. CEO of Vianah. Keith.myers@vianah.com

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3. Karen Tailby (Project Manager)

Address: C/o 9 Highland Close, Bletchley, Milton Keynes, MK3 7PF, UK & Jr. Lambayeque 488, Casilla 28, Puerto Maldonado, Madre de Dios, Peru.
Tel. (Peru): +51-(0)82-572788 **E-mail:** karentailby@hotmail.com
Nationality: British **DoB:** 28th Feb. 1962 **Marital Status:** Divorced

Education

No Higher Education.
7 "O" levels.

Positions Held

Mar 2001 – to date	Two years into a 5 year career break, encompassing Global Travel and voluntary participation in conservation and animal welfare initiatives
Dec. 2002 – Mar. 2003	Abbey National. Project Manager – Endowment Complaints Handling – Project budget £4.86m. Day to day management of project to identify and implement solutions to operational area to enable Abbey National to manage influx of endowment complaints. Included implementation of Outsource Solution (50 FTE) in challenging timescales, project planning, scenario modelling and management of relationship, along with normal project management activities (risks, issues, finances, etc.). Exposure to Executive Directors, Retail Director, Corporate Resources Director and FSA (Financial Services Authority).
Jun. 2000 – Mar. 2001	Abbey National. Project Manager – Flexi Finance, Retail Transformation Programme. Day to Day Management of project start up to develop on line propositions across IDTV, WAP and PC and single log-on for all consumer e-commerce offerings. Liaison with senior management, cross divisional systems and operational areas. Major challenge – to achieve Executive acceptance that the project was neither economically viable or feasible within required timescales. Agreement reached to reduce scope to one Product offering on Internet only. Left prior to project completion.
Apr. 1999 – Jun. 2000	Abbey National. Project Manager – e-banking, Retail Transformation Programme. Budget £28.5m. Selected by Programme Manager to manage e-banking project. Project involved: Development and Documentation of detailed Business Requirements; Develop High level Plan, and subsequently the detailed plan against which progress was ultimately

	reported; Obtain Sponsor/stakeholder buy in and manage expectations on ongoing basis; Resource mobilisation – involving staff from across the business and systems community within Abbey National, along with external consultants and contractors; Establish Project framework, Steering and Project Working groups; Issue and risk management; Develop communications plan, to include corporate activities and cross-project dependencies; Provision of updates and escalation of issues to Executive Director and Retail Director level.
Aug. 1998 – Apr. 1999	Abbey National. Project Manager, Programme Office. Involved in a number of small, short-term but high profile initiatives including Customer Migration and ATM Development. Abbey National at this time went through transitional period and changes in strategy.
Apr. 1998 – Aug. 1998	Abbey National. Project Manager, Channel Development. Assisted in the launch of trials of Cheque Deposit Boxes across our retail network, as part of Customer Migration activities. Implemented trials, monitored effects and reported results through to Executive Directors for decision to launch nationally.
1995 – Apr. 1998	Abbey National. Consultant, Banking Strategy. Reporting through to Manager, Banking Strategy, involved in high profile, high impact projects including: Migration of external card portfolio to internal systems (350,000 customers); Launch of co-branded card with supermarket chain; Launch of Abbey National Credit Card.
1992 – 1995	Abbey National. Manager Visa Operations. Set up/managed team for Abbey Nationals Visa Card operational activities, including Authorisations, Visa Centre Manager, Customer Claims, Lost/Stolen card reporting. Along with Manager, recognised as company experts in Card Programmes and provided consultancy across the group on any Card related issues.
1987 – 1992	Abbey National. Card Services. Held a number of positions from Clerk through to Deputy Section Manager, responsible for a team of circa 15 staff. Involved in testing and developing procedures for launch of new Visa Card Offering.

References

Appendix 1: Photos.

View over Tambopata River from canopy tower in native Community of Infierno. Brazil-nut (*Bertholletia excelsa*) tree in foreground (photo A. Farris).

Jaguar (*Pathera onca*) tracks in soft mud at the Tambopata Research Center (photo A. Farris).

Tambopata Research Center (photo C. Kirkby).

Blue-and-yellow macaws (*Ara ararauna*, left) and Scarlet macaws (*A. macao*, right), Tambopata Research Center (photo A. Farris).

Project Tambopata Team, Reserva Amazónica Lodge, Jan. 1997.

Emerald tree boa (*Corallus caninus*) (photo R. Masias).